

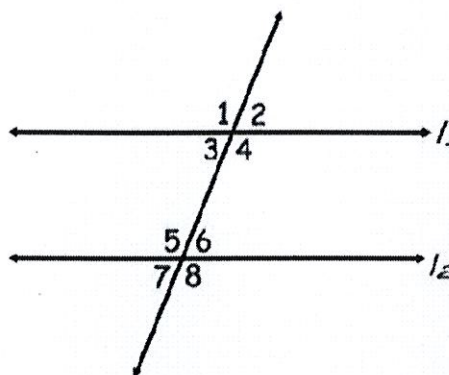
2.13 Converse to Parallel Line Theorems

Corresponding Angles CONVERSE Postulate

Theorem to prove: **Alternative Interior Angles Converse**

Given: $\angle 3 \cong \angle 6$

Prove: $l_1 \parallel l_2$



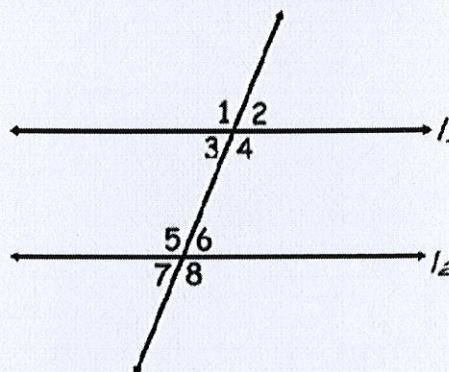
Statements	Reasons
1. $\angle 3 \cong \angle 6$	1. Given
2. $\angle 3 \cong \angle 2$	2. vertical angles theorem
3. $\angle 2 \cong \angle 6$	3. transitive prop.
4. $l_1 \parallel l_2$	4. corresponding angles converse

WLPCS
Geometry

Theorem to prove: **Alternative Exterior Angles Converse**

Given: $\angle 1 \cong \angle 8$

Prove: $l_1 \parallel l_2$

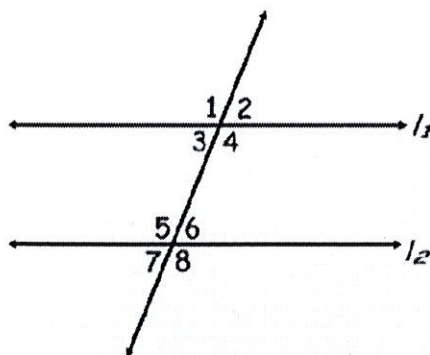


Statements	Reasons
1. $\angle 1 \cong \angle 8$	1. Given
2. $\angle 1 \cong \angle 4$	2. vertical angles theorem
3. $\angle 4 \cong \angle 8$	3. transitive prop.
4. $l_1 \parallel l_2$	4. corresponding angles converse

Theorem to prove: Same Side Interior Angles Converse

Given: $\angle 3$ and $\angle 5$ are supplementary

Prove: $l_1 \parallel l_2$



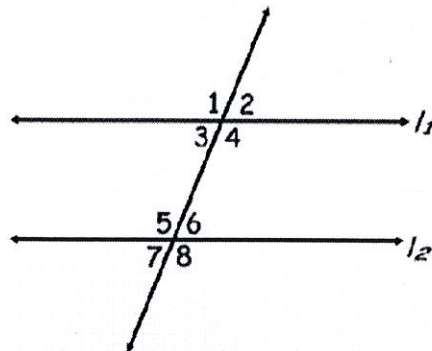
Statements	Reasons
1. $\angle 3$ and $\angle 5$ are supplementary	1. Given
2. $m\angle 3 + m\angle 5 = 180^\circ$	2. def. of supplementary
3. $\angle 1$ and $\angle 3$ are a linear pair	3. def. of linear pair
4. $\angle 1$ and $\angle 3$ are supplementary	4. linear pair postulate
5. $m\angle 1 + m\angle 3 = 180^\circ$	5. def. of supplementary
6. $m\angle 3 + m\angle 5 = m\angle 1 + m\angle 3$	6. substitution
7. $m\angle 5 = m\angle 1$	7. subtraction prop.
8. $\angle 5 \cong \angle 1$	8. def. of \cong angles
9. $l_1 \parallel l_2$	9. corresponding angles converse

very
detailed!
not
expected

Theorem to prove: Same Side Exterior Angles Converse

Given: $\angle 1$ and $\angle 7$ are supplementary

Prove: $l_1 \parallel l_2$



Statements	Reasons
1. $\angle 1$ and $\angle 7$ are supplementary	1. Given
2. $m\angle 1 + m\angle 7 = 180^\circ$	2. def. of supplementary
3. $m\angle 1 + m\angle 3 = 180^\circ$	3. def. of supplementary
* okay to skip linear pair step(s) *	
4. $m\angle 1 + m\angle 7 = m\angle 1 + m\angle 3$	4. Substitution prop.
5. $m\angle 7 = m\angle 3$	5. Subtraction prop.
6. $l_1 \parallel l_2$	6. corresponding angles converse